Pathways to phase-out contentious inputs from organic agriculture in Europe: WP5 SOIL

14 WP5 partners from 9 countries

With 9 multi-actors and 5 university partners, and a total workload of 103.7 working months (planned 127), WP5 SOIL is well equipped for research to phase out contentious inputs from organic growing:

PEAT

PLASTIC

ANIMAL-DERIVED FERTILISERS

Peat will be studied as an input in various growing media in horticulture.

Plastic will be studied for use as a soil cover.

Manure from non-organic sources is the main focus, but **fertilisers** complying with vegan standards will also be studied (e.g. green manure).

WP5 tasks (T)

T5.1 Determine the current extent of the use of peat, plastic and animal-derived fertilisers across Europe, and examine the reasons for use (Map)

T5.2 Identify possible alternatives (Altern)

T5.3 Examine the potential of agroforestry and plant by-products to deliver alternatives (Wood)

T5.4 Examine fertiliser alternatives (Ferts)

T5.5 Examine peat alternatives (Peat)

T5.6 Examine plastic mulch alternatives (Plastic)

T5.7 Interaction with stakeholders, dissemination, examine barriers to uptake of alternatives (Barriers)

Person months per task in WP5

Partner Sum months	5.1 Map	5.2 Altern	5.3 Wood	5.4 Ferts	5.5 Peat	5.6 Plastic	5.7 Barrier
NORSØK 13.5	3.5	1	0.5	6	1	0.5	1
SEGES 6.7	0.5	2.5		3			0.7
ABioDoc 0.7	0.5						0.2
FORI 4.7	0.5	2			1.5		0.7
ATB 9.7			6.7		1	2	
UoH 10.8				9		1.3	0.5
UTH 3.2	0.5				2.2		0.5
CUT 12.5	0.5		0.5	3		7.5	1
IRTA 11	0.5		2.5		7		1
ESA 3					3		
MFAL 13	0.5		2.5		3	6	1
SA 1.2		1.2					
RHS 2.2							2.2
CU 11.5	0.5	0.5		3	2	2.5	3

Yellow indicates task leader

Objectives

Reduce the current dependency of organic agriculture on manure from non-organic farms and other animal-derived fertilizers, on peat for horticulture, and on fossil-fuel derived plastic mulch, by…..

1) Assessing the use of animal-derived non-organic fertilizers, peat, and fossil-derived plastic mulches in 10 European countries (not Sweden, not Switzerland; ITALY?)
2) Identifying alternatives; available, new innovations, and results of phasing-out without replacements
3) Characterizing relevant alternatives (e.g. availability), and study their function compared with existing inputs
4) Developing system approaches to integrate alternatives in existing organic cropping systems
5) Developing pathways for uptake of alternatives by agricultural practice, while identifying technical, economic and social barriers preventing implementation
6) Testing system effects (with WP6), to ensure environmental impacts are lower than that for existing inputs
7) Assessing the acceptance of the alternatives by organic stakeholders and integrate stakeholder demands in the research process

Deliverables

Peer-reviewed paper on T5.1 (D5.1), October 2018
Peer-reviewed paper on T5.2 (D5.2), January 2019
Technical paper on defibring wood to increase decomposition, April 2019 (D5.3a)
Technical paper about material requirements as peat substitute, April 2020 (D5.3b)
Peer-reviewed paper on defibred materials to replace peat, December 2020 (D5.3c)
Peer-review paper on fertilisers, state-of-art, October 2021 (D5.4a)
Report + factsheet on fertilisers, October 2021 (D5.4b)
Peer-rev. paper on peat-reduced growing media, Oct.2021 (D 5.5a)
Farmers' open days to present D 5.5a, UK Oct.2021 (D 5.5.b)
Peer-review paper on mulching, state-of-art, October 2021 (D5.6a)
Report on mulching, October 2021(D5.6b)
Peer-rev. paper on barriers, April 2022 (D5.7)

Outputs

Conferences/workshops

Denmark: National Organic Conference, November 2020

Germany: Open day for farmers, Kleinhohenheim, October 2019, October 2020

Wissenschaftstagung Ökologischer Landbau 2019 and 2021

Annual conferences of Demeter and Bioland

Norway: National seminar with HiOA (WP2), Oslo, March 2022

Poland: National seminar about biodegradable plastic mulch, March 2022

Technological seminar on biodegradable non-fossil derived materials for agriculture and horticulture

Annual industry-focused conference on biochar applications organised by Biomass Media Group; project associated partner

UK: Open day and workshop for farmers on the use of composted wood chips to replace peat, April 2021

Open day on biodegradable plastic mulch, October 2021

Written publications

11 peer-reviewed journal papers (planned 3!, now proposed 6)

20 non-academic papers

3 fact sheets on alternatives to fertilizers, peat and fossil-fuel derived plastic mulch.

Methods

T5.1: Ask informants to map inputs: Advisors, certification bodies, grower's associations. Discuss differences between countries. Map alternative solutions and policies affecting inputs.

T5.2: Review scientific results of alternatives, link to WP2 survey (Task 2.2). Modify experimental details in T5.4, 5.5. and 5.6 based on T5.2 results.

T5.3: Study defibred wood particles; raw materials from Spain and Turkey treated at ATB and returned for compost experiments in T5.5 and mulch experiments in T5.6 (UK, Turkey)

T5.4 has 3 experiments: 1. Legume-based fertilisers (dried, digested, vegan standard) will be tested with white cabbage at UoH and tomatoes in UK (CU). Nutrients for legumes derived from digested household waste. Mulch material from T5.3 tested at UoH.

2. Marine-derived fertilizers and struvite will be tested in ryegrass (pot study, NORSØK); struvite and marine-derived fertilisers will be tested in cereals (field study, SEGES).

3. Organic fish-pond sediments will be (vermi)composted and tested as fertilisers at CUT (pot study, lettuce).

T5.5 FORI will summarize (German) results of replacing peat by wood-fibres. Plant residues will be collected in 2018 (MFAL, IRTA) , chopped and dried, transported to ATB (T5.3), defibred and brought back for compost studies, then further treated (e.g. nutrient enriched) to produce growing media. Test of growing media at ESA and Delfland nursery (UK, Tolhurst Organics growing media). Cocoa bean shells will be tested as ingredient in growing media by UTH and IRTA.

T5.6 Biochar as filler may enhance water holding capacity, reduce cost and allow for modifying nutrient applications. Plastics from Poland will be tested in Turkey (MFAL) and UK (CU).

T5.7 Stakeholders will be engaged in fringe meetings at relevant conferences and events; and interviewed. Peat Task Force (UK) concept will be followed (RHS).

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